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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,447	10/26/2001	Timothy J. Dalton	FIS920010239US1	3611

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EXAMINER	
LEWIS, MONICA	
ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/002,447	DALTON ET AL.	
	Examiner	Art Unit	
	Monica Lewis	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed May 25, 2004.

Response to Arguments

2. Applicant's arguments with respect to claims 1-9 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 6 and 18 are rejected under 35 U.S.C. 103(a) as obvious over Barth (U.S. Publication No. 2002/0084507) in view of Agarwala et al. (U.S. Patent No. 6,033,939).

In regards to claim 1, Barth discloses the following:

a) a conductive layer (11 and 15), said conductive layer completing a conductive path between wiring segments included a wiring layer (For Example: See Figure 1);

b) material (10) encapsulated underneath said conductive layer and in continuous contact with said conductive layer (For Example: See Figure 1); and

c) the fuse structure is blown open by application of a beam of laser energy thereto (For Example: See Figure 2 and Abstract).

In regards to claim 1, Barth fails to disclose the following:

a) organic material.

However, Agarwala et al. ("Agarwala") discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary

skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

In regards to claim 2, Barth discloses the following:

a) liner material (12) further encapsulating said material between said wiring layer and said conductive layer (For Example: See Figure 1).

In regards to claim 2, Barth fails to disclose the following:

a) organic material.

However, Agarwala discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

In regards to claim 3, Barth discloses the following:

a) organic material is selected from a group that includes a polyimide, a polyamide, a polyarlyene ether, a polyaromatic hydrocarbon (PAH), and a conductive polyaniline.

However, Agarwala discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of

organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

In regards to claim 6, Barth discloses the following:

a) a pair of vias formed within an insulating layer and extending down to said wiring segments; and a mesa region of said insulating layer formed between said pair of vias; liner material is formed upon sides of said mesa region and said wiring segments. (For Example: See Figure 1).

In regards to claim 18, Barth discloses the following:

a) an electrically conductive material, said electrically conductive material completing a conductive path between wiring segments included in a wiring layer (For Example: Figure 1);

b) a pair of vias included in the fuse structure and formed within an insulating layer, said pair of vias extending down to said wiring segments (For Example: See Figure 1); and

c) the fuse structure is blown open by application of a beam of laser energy to said electrically conductive material (For Example: See Figure 2).

In regards to claim 18, Barth fails to disclose the following:

a) an organic material filling the vias.

However, DiStefano discloses the use of organic material in vias (For Example: See Column 13 Lines 4-13). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Agarwala to include the use of organic material as disclosed in DiStefano because it remains solid at temperatures below the activation temperature (For Example: See Column 13 Lines 4-13).

Additionally, since Agarwala and DiStefano are both from the same field of endeavor, the purpose disclosed by DiStefano would have been recognized in the pertinent art of Agarwala.

b) organic material.

However, Agarwala discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as obvious over Barth (U.S. Publication No. 2002/0084507) in view of Agarwala et al. (U.S. Patent No. 6,033,939) and Stamper (U.S. Patent No. 6,111,301).

In regards to claim 4, Barth fails to disclose the following:

a) a liner material selected from a group that includes TaN, Ta, TiN, Ti, W, WN, TaSiN, TiSiN.

However, Stamper discloses the use of liners (For Example: See Column 2 Lines 45-65). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of liners as disclosed in Stamper because it is resistant to corrosion and aids in separating the wiring (For Example: See Column 2 Lines 45-65).

Additionally, since Barth and Stamper are both from the same field of endeavor, the purpose disclosed by Stamper would have been recognized in the pertinent art of Barth.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as obvious over Barth (U.S. Publication No. 2002/0084507) in view of Agarwala et al. (U.S. Patent No. 6,033,939) and Lee et al. (U.S. Patent No. 6,300,233).

In regards to claim 5, Barth fails to disclose the following:

a) conductive layer is selected from a group that includes TaN, Ta, TiN, Ti, W, WN, TaSiN, TiSiN, or alloys therefrom.

However, Lee discloses the use of TiN and W (For Example: See Column 3 Lines 43 and 44 and Column 4 Lines 33-40). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use TiN or W as disclosed in Lee because it provides dense physical properties (For Example: See Column 4 Lines 53-56).

Additionally, since Barth and Lee are both from the same field of endeavor, the purpose disclosed by Lee would have been recognized in the pertinent art of Barth.

7. Claims 7-9 are rejected under 35 U.S.C. 103(a) as obvious over Barth (U.S. Publication No. 2002/0084507) in view of Agarwala et al. (U.S. Patent No. 6,033,939) and DiStefano et al. (U.S. Patent No. 5,590,460).

In regards to claim 7, Barth fails to disclose the following:

a) pair of vias is filled with said organic material.

However, DiStefano et al. ("DiStefano") discloses the use of organic material in vias (For Example: See Column 13 Lines 4-13). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in DiStefano because it remains solid at temperatures below the activation temperature (For Example: See Column 13 Lines 4-13).

Additionally, since Barth and DiStefano are both from the same field of endeavor, the purpose disclosed by DiStefano would have been recognized in the pertinent art of Barth.

In regards to claim 8, Barth fails to disclose the following:

a) organic material further occupies an inner area of the fuse structure, said inner area between the top of said mesa region and said conductive layer.

However, Agarwala discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

In regards to claim 9, Barth discloses the following:

a) conductive layer covers said inner area, thereby completing said conductive path (For Example: See Figure 2).

In regards to claim 9, Barth fails to disclose the following:

a) organic material.

However, Agarwala discloses the use of organic material (For Example: See Column 8 Lines 21 and 22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Barth to include the use of organic material as disclosed in Agarwala because it is resistant to corrosion (For Example: See Column 7 Lines 5-11).

Additionally, since Barth and Agarwala are both from the same field of endeavor, the purpose disclosed by Agarwala would have been recognized in the pertinent art of Barth.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final

communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML
July 29, 2004

Mary Wilczewski
Primary Examiner